

REMARKS

Claims 1-15 are pending in the application, with claims 1 and 5 being in independent form. Applicants acknowledge the allowance of claims 5-13. Claims 1-4 and 14-15 have been rejected.

Claim 1 is being amended to positively recite the light emitting section which emits light to fruits or vegetables; a light receiving section which receives transmitted light; and a control device which obtains inner quality information of the measured object. Basis for this amendment can be found in the originally filed disclosure. No new matter is being added.

ARGUMENTS

Claim 1 is objected to because the phrases in the preamble such as "for emitting" and "for transmitting" are taken to express intended use and are not given patentable weight. The Examiner suggests using the word "which" to positively recite these features of the claim. Claim 1 has been amended as suggested by the Examiner. Accordingly, it is respectfully requested that the objection to claim 1 be withdrawn.

Claims 1 and 3-4 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,930,994 to Conway et al. (hereinafter referred to as "Conway et al."). The Examiner contends that Conway et al. teaches each and every limitation of the claims. With respect to the claimed feature of a control device that repeatedly executes a charge storage discharge process, the Examiner references col. 8, line 48-col. 9, line 4. The Examiner further states that the capacitor disclosed at col. 8, lines 65-66 and subsequent charge integration performs the same function as a "charge storage discharge process".

We disagree. It does not appear that this capacitor in the Conway et al. device performs the function of repeatedly executing the charge storage discharge process whenever the measurement charge storage process is off in order to sufficiently release the charges stored in the photo-detective sensor.

Claim 1 recites a quality evaluation apparatus for fruits and vegetables wherein the control device repeatedly executes a charge storage discharge process for allowing the photo-detective sensor to store charges until a predetermined charge storage time elapses from start of charge storage and then releasing the charges

stored in the photo-detective sensor until lapse of a predetermined discharge time when the measured object is not present in the position for measurement or when the photo-detective information for quality evaluation has already been obtained even if the measured object is present in the position for measurement. Claim 1 further recites that the control device allows the photo-detective sensor to release the charges stored therein until the predetermined discharge time elapses when the measured object transported by the transporting device reaches the position for measurement, and then executes a measurement charge storage process for storing charges in the photo-detective sensor to be used as the photo-detective information for quality evaluation until lapse of a predetermined measurement time.

Accordingly, due to these claimed features, as stated in the specification at page 9, lines 8-15, the charge storage discharge process is repeatedly executed whenever the measurement charge storage process is off. Thus, the operation for releasing the stored charges is repeated at predetermined time intervals, thereby to sufficiently release the charges stored in the photo-detective sensor. This results in a reduced chance of the charges remaining in the photo-detective sensor after the operation for releasing the charges is completed. Further, as stated in the specification at page 10, lines 6-9, the quality evaluation apparatus, including the features recited in the claims, is capable of reducing error in the inner quality information of the measured objects by obtaining the photo-detective information for quality evaluation in an utmost proper condition with the residual charges reduced in the photo-detective sensor.

As described in the specification, the claimed quality evaluation apparatus is useful for measuring the quality of various objects, such as oranges, apples, and the like. The qualities measured include the inner quality of the objects, such as sugar content, acid degree or the like, in a non-destructive condition. This measurement is done successively, but it sometimes becomes prolonged until the next object comes into position for measurement thereof. If a measurement charge storage process is executed, even during such a period of time where objects are not being transported, without executing a charge discharging operation from the photo-detective sensor, a small charge can accumulate. Even this small charge can

cause an error with respect to the inner quality information of the object being measured.

To overcome this problem, the present invention claims a control device that repeatedly executes a charge storage discharge process for allowing the photo-detective sensor to store charges until a predetermined charge storage time elapses from the start of the charge storage and then releasing the charges stored in the photo-detective sensor until a lapse of a predetermined discharge time, when the measured object is not present in the position for measurement or when the photo-detective information for quality evaluation has already been obtained, even if the measured object is present in the position for measurement. This allows the claimed apparatus to sufficiently release the charges stored in the photo-detective sensor until the next object comes into position for measurement.

As stated above, Conway et al. fails to teach or suggest a device that performs the function of repeatedly executing the charge storage discharge process whenever the measurement charge storage process is off in order to sufficiently release the charges stored in the photo-detective sensor.

The Examiner states that the capacitor, disclosed at col. 8, lines 65-66 of Conway et al., and subsequent charge integration, perform the same function as a "charge storage discharge process". However, Conway et al. merely teaches storing and releasing of the charge. Unlike the present invention, Conway et al. fails to teach repeatedly storing and releasing the charge each period of time between the two measuring processes for a previous object and its subsequent object.

With respect to claims 3 and 4, the Examiner relies on the teaching of Conway et al. of timing sensors 37, 38. These timing sensors are utilized in connection with a timing circuit to obtain timing signals for coordinating certain operating phases of the internal quality computer. The timing sensors are activated when the skin portion of the leading end of the fruit covers one of the sensors. Conway et al. does not teach a saucer detecting device as recited in the claims.

Accordingly, for the reasons set forth above, it is respectfully requested that the rejection of claims 1 and 3-4 under 35 U.S.C. §102(b) be withdrawn as Conway et al. fails to teach each and every limitation of the claims.

Claims 2 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conway et al. as applied to claim 1 and further in view of United States Patent No. 6,754,600 to Hashimoto et al. (hereinafter referred to as "Hashimoto et al."). The Examiner acknowledges that Conway et al. fails to teach the claimed feature of an incidence switching device. The Examiner relies on the teachings of Hashimoto et al. as teaching incidence switching devices to be well known and that it would have been obvious to employ an incidence switching device in the Conway et al. device in order to avoid partial measurements while the object is in motion. As stated above, Conway et al. fails to teach the claimed feature of base claim 1 of a control device which repeatedly executes a charge storage discharge process. This deficiency is not overcome by the Hashimoto et al. reference.

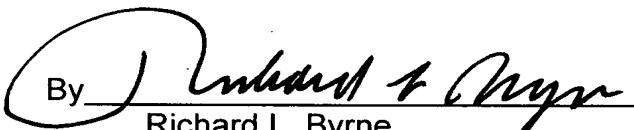
Accordingly, for the reasons set forth above, it is respectfully requested that the rejection of claims 2 and 14-15 under 35 U.S.C. 103(a) be withdrawn as the combination of Conway et al. with Hashimoto et al. fails to render these claims obvious.

CONCLUSION

Applicants acknowledge with thanks, the allowance of claims 5-13. Based on the foregoing amendments and remarks, reconsideration of the rejection and allowance of pending claims 1-4 and 14-15 are respectfully requested.

Respectfully submitted,

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